Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
30 SEP 1999		**00-00-1999 to 00-00-1999**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
The Taxonomy of the Harpacticoid Copepods of the Northern Gulf of Mexico: a Taxon of Potential Importance to the Navy	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Florida State University,Department of Oceanography,Tallahassee,FL,32306**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**2**	

The Taxonomy of the Harpacticoid Copepods of the Northern Gulf of Mexico: a Taxon of Potential Importance to the Navy

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LONG-TERM GOALS

There is a crisis in taxonomy. The professionals who could identify species and describe new taxa are literally dying, and their jobs are being eliminated or shifted to other disciplines. If the infrastructure of ecology, in particular, and biology generally is to be maintained, a way has to be found to train new workers in taxonomy while simultaneously making them employable. It is my long-term goal to contribute to the solution of this problem.

OBJECTIVES

I believe that this goal can be achieved by training graduate students in oceanography to do the taxonomy of the groups they study, thus passing taxonomic skills to a new generation. A doctoral student Lori Bouck is being trained in this way in my laboratory.

APPROACH

The Navy has had a long-term presence in harbors and the estuaries in which they are situated. The environmental consequences of this presence is of concern. To determine if impact has occurred (or if recovery of an impacted area is complete) will require comparison of faunas from impacted and control sites, which will depend on an infrastructure of scientific names. Because not all organisms can be studied, target groups must be used for such comparisons. Because of their ubiquity and abundance, harpacticoid copepods (Crustacea) are particularly appropriate for this purpose. Therefore, the taxonomic education of the student mentioned above is focused on the harpacticoid copepod fauna of estuaries.

The student and I are studying harpacticoids from subtidal, estuarine sediments from the northern Gulf of Mexico. For abundant species that appear to be new to science, we assemble the relevant taxonomic literature to confirm that the species have not been previously been described. We then dissect, mount, and illustrate specimens to provide the information needed to formally describe the species. We supplement this light-microscope work with parallel investigations using the scanning electron microscope.

Because this grant is a training grant, the student and I have also been studying treatises on modern taxonomic methods and have been consulting with other harpacticoid taxonomists about techniques.

WORK COMPLETED

During FY99, we completed our study the taxonomy of the genus *Zausodes* in north Florida waters. A manuscript describing three new species and two existing species has been accepted for publication by the Bulletin of the British Museum (Natural History).

Taxonomic illustrations traditionally have been inked by hand. This technique is slow and mistakes are difficult to correct. Rather than teach the student this approach, I suggested that she investigate computer-aided drawing. This effort has been a great success. It shortens the time needed to prepare an illustration, allows mistakes to be easily fixed, and greatly facilitates the preparation of plates. The student and I prepared a manuscript describing our techniques, which is in press in *Vie et Milieu*.

RESULTS

The student continues to make good progress in acquiring taxonomic skills. She has presented her work at scientific meetings and has begun publishing in this field. With the completion of the *Zausodes* study, she has begun work on *Protopsammotopa,* which is abundant in northern Florida..

IMPACT

See OBJECTIVES.

TRANSITIONS

Our discovery that computer-aided drawing can be used for taxonomic illustrations may change the way such illustrations are made. The student and I have presented two posters on our procedures at scientific meetings. Several professional taxonomists have expressed interest in learning our methods; we have distributed many preprints of the paper describing the technique. We are preparing a protocol, which we will place on our web site.

RELATED PROJECTS

None.

PUBLICATIONS

Bouck, L., D. Thistle, and R. Huys. In press. Systematics and phylogeny of *Zausodes* C. B. Wilson (Copepoda, Harpacticoida, Harpacticidae) including three new species from the northern Gulf of Mexico. *Bulletin of the British Museum (Natural History).*

Bouck, L. A., and D. Thistle. In press. A computer-assisted method for producing illustrations for taxonomic descriptions. *Vie et Milieu*.